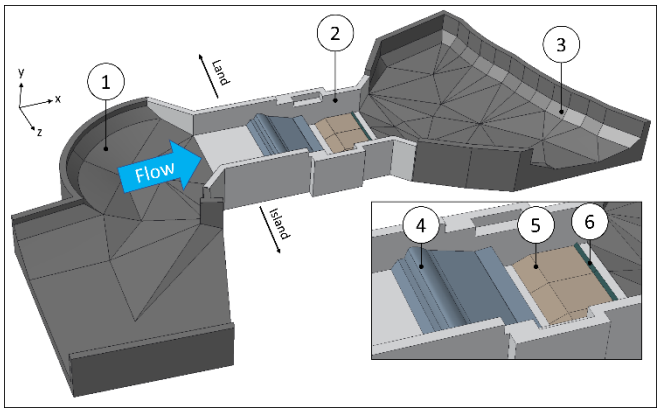
# Master thesis

**To students at the Technical Faculty /**

(Computational engineering, Medical Engineering, Maschinenbau)

Friedrich-Alexander-Universität Erlangen-Nürnberg

**Title: Standing surf-waves: Computational analysis of different configurations of the wave's inflow region to improve wave characteristics**




Standing river waves are becoming more and more popular for surfing. For receiving a working, i.e. surfable wave, several physical conditions have to be considered as overall geometry, topology of the floor upstream and downstream of the wave, height of fall, water velocity. The **goal of this work is to improve and optimize the flow topology of the inflow region upstream of the wave** for a given basic lateral geometry (see Figure) considering varying flow rates. The thesis builds on a previous MA thesis where first topology variations have been found (i.e. chicaneries on the bottom) that improved already the outflow region downstream of the wave. The CAD model of the wave has been established and the CFD model has been implemented in STAR-CCM+ using nonstationary fluid dynamics.
The tasks are to (1) adapt the current CAD model for the analysis of the inflow region. (2) Performing parameter studies by varying geometric boundary conditions of the channel sides and floor (i.e. positioning baffler in the inflow region at various positions. (3) Verify results for different flow rates. Goal is to achieve a nearly perfect (i.e. laminar) inflow yielding improved wave conditions (i.e. smooth wave surface with only few vortices without backwash). If successful, the numerical results may be transferred and implemented to the Fuchslochwelle in Nürnberg.

The work will be supervised by **Prof. Dr.-Ing. Michael Döllinger (Member of Department Informatik & AIBE)** and **PD. Dr. Stefan Kniesburges (Laboratory CM I)**.

**We search for a dedicated and motivated student** with

- experience in CFD modeling and simulation
- knowledge and experience in scientific programming in the field of fluid dynamics

**Tasks:**

- Enhancement of the current CFD model in STAR-CCM+
- Numerical parameter studies as described above

**Contact persons:**

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